AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

Claim 1. (Currently Amended) A method for determining bone density loss in a human patient, comprising:

storing in an electronic storage medium, as reference values, measurement values of one of real and mathematically simulated bone density loss processes, as a function of time, the measurement values being determined according to one of medically accepted practical and theoretical clinical signs and symptoms of bone density loss[[;]] , wherein a process step x is used to determine measured values by utilizing common laboratory techniques from serum or urine samples by sample preparation steps comprising at least one of treating with antibodies, incubation steps, separation procedures, and using analytical techniques;

measuring, at one or more points in time, bone marker values of one of serum and urine samples of the patient associated with bone density losses;

recording the bone marker values over an input mask in an electronic data memory; and

processing the bone marker values relative to the reference values to determine bone density loss in the patient, said processing comprising performing the following sub-steps of:

a) copying all N available measured bone marker values M of the patient, measured at times $t_1 \ldots t_n$, from the electronic data memory, over an interrogation function, to make the measured values available for further processing, such that measured bone marker values M (t_n; k) of K <u>bone markers, K being the number of bone markers,</u> are determined in the laboratory after process step x, at times $t_1 \ldots t_n$;

b) normalizing the measured values of the bone markers with respect to a first line in a table of <u>measured</u> values, determined according to the equation

$$M^*(t_n;k) = \frac{M(t_n;k) - M(t_1;k)}{M(t_1;k)} \qquad k = 1,\ldots,K; \quad n = 1,\ldots,N$$

to form normalized values of the bone markers, and converting the <u>times that correspond to the</u> normalized values into time values, measured in units of months,

c) converting the normalized values into a scalar quantity $D(t_n)$ to obtain a description of a graduated course of bone density loss, said description of the graduated course of bone density loss being defined by the equation

$$\cancel{D(t_n) = \sqrt{\sum_{k=1}^{K} Wk \left(M^*(t_n;k)\right)^2}}$$

$$D(t_n) = \sqrt{\sum_{k=1}^{K} W_k \cdot \left(M^*(t_n;k)\right)^2}$$

wherein W_1, W_2, . . . W_k are weighting factors and, in a standard determination, $W_k = 1$

d) calculating, from evaluations of the course of bone density loss, interpolated values of the course, for time periods for which reference values are available, according to the equation

$$\cancel{D^*(t)=\frac{(t_n-t)\cdot D(n-1)+(t-t_{n-1})\cdot D(n)}{t_n-t_{n-1}}\quad ,t_\in\left[t_{n-1},t_n\right]}$$

$$D^*(t)=\frac{(t_n-t)\cdot D(n-1)+(t-t_{n-1})\cdot D(n)}{t_n-t_{n-1}}\quad ,t\in\left[t_{n-1},t_n\right]$$

e) calculating, from the interpolated values of the course of bone density loss, values of ~~a first~~ similarity ~~dimension~~ dimensions between data being investigated ~~and~~, all available reference values, and the time in months, according to the function

$$\cancel{A_j(t)\cdot\sum_{m=1}^{M}\frac{t_m}{t_M}\cdot V_m\cdot\left(R_j(t_m-D^*(t_m)\right)^2}$$

$$A_j(t) = \sum_{m=1}^{M} \frac{t_m}{t_M} \cdot V_m \cdot \left(R_j(t_m) - D^*(t_m)^2\right)$$

wherein $V_1, V_2, \ldots V_m$ are weighting factors and, in a standard determination, $V_m = 1$

~~and simultaneously calculating values of a second similarity dimension between the reference values and the previously determined values of time, measured in units of months~~;

f) determining, from the first and second similarity dimensions, for all reference values, a mathematical similarity for each of said reference values according to one of the following type descriptions, determined from the respective accompanying formula:

greatest similarity: $\cancel{A^* = \min_{j=1,\ldots J}\{A_j\}}$

$$A^* = \underbrace{\max}_{j=1,\ldots,J}\{A_j\}$$

positive alternative (+) ~~A⁺ = min {Aj} j=1,...J.Aj≠A*.Rj(tN)>D(tN)~~

$$A^{+} = \underbrace{\min}_{j=1,..,J;A_j\neq A^{*};R_j(t_N)>D(t_N)} \{A_j\}$$

negative alternative (-) ~~A⁻ = min {Aj} j=1,...J.Aj≠A*.Rj(tN)<D(tN)~~

$$A^{-} = \underbrace{\min}_{j=1,..,J;A_j\neq A^{*};R_j(t_n)<D(t_n)} \{A_j\}$$

and outputting the type description <u>as text component</u> for each given situation;

g) deriving a predicted value from reference values for each of the type descriptions determined according to the three formulas in sub-step (f), and, such that if $B_1 = A^*$, $B_2 = A^+$, $B_3 = A^-$, using the following expression

$$R(t) = \frac{1}{\sum_{i=1}^{3} B_i} \cdot \sum_{j=1}^{3}\left(\left(\sum_{i=1}^{3} B_i - B_j\right)\cdot R_j(t)\right)$$

for the predicted value at time t<u>, wherein $R_j(t)$ are reference functions for describing the anticipated course of the bone density loss for the type j</u>;

h) optimizing a quantitative prediction of the bone density loss by assigning standard specifications to degrees of freedom given as functional parameters in a functional relation between $D(t_n)$ and $A_j(t)$; and performing a statistical analysis for fitting ~~to determine goodness of fit between~~ of the reference values ~~and~~ to the measured values ~~values obtained from actual experience~~; and

i) calculating a value of a time at which, according to said quantitative prediction, a percentage deviation is greater than a specified threshold value, said calculated value of time being a starting point for planning scheduling of a next investigation.

Claim 2. (Previously Presented) The method of claim 1, wherein degrees of freedom, given as function parameters in said functional relation between $D(t_n)$ and $A_j(t)$, are provided by a mathematical method of least squares, so that specified sequences are taken into consideration in an optimum way for reference values.

Claim 3. (Previously Presented) The method of claim 1, wherein the reference values are calculated values, calculated from an analytical mathematically assumed course of bone density loss.

Claim 4. (Currently Amended) The method of claim 1, wherein the reference

values are ~~empirical~~ values from hypothetical, assumed processes.

Claim 5. (Previously Presented) The method of claim 1, wherein the reference values are actual values obtained from patients with known amounts of bone density loss.